## ABSTRACT

A process for the low temperature, non-incineration decontamination of contaminated materials, such as chemical weapon components containing residual quantities of chemical warfare agents. The process includes the steps of (a) contacting the contaminated materials with steam at substantially ambient pressure in a substantially dry first heated vessel for a period of at least about 15 minutes, the steam being at a temperature of at least about 560°C, (b) removing condensible and non-condensible gases from the first heated vessel and heating them in a second vessel at substantially ambient pressures to temperatures of at least about 500°C for a period of at least about one second in an atmosphere containing steam to convert 99.99 wt.% of the chemical warfare agents to non-chemical warfare agents, and (c) treating non-condensible gases from the second vessel with a chemical absorbent, so as to reduce the concentration of chemical warfare agents to less than about 1.0 mg/m³ at standard temperature and pressure.